

**Comments on Kicker Review  
February 1, 2002**

**Responses by Bruce Baller  
May 6, 2004**

Long Ceramic Beam Tubes

Presenter: R. Reilly

1. (Reviewer: T. Anderson) Comments on proposal of using recovered long ceramic beam tubes for NuMI: It's a no-brainer, use the old tubes with Rob's modified end plates.

OK

2. (Reviewer: D. Capista) All considered, it seems clear that using the recovered ceramic tubes is the correct choice at this time.

OK

3. (Reviewer: D. Jensen) I agreed that it was reasonable to continue with the current design using the salvaged ceramic beam tubes. But it is a matter of concern to use components with a very limited spare inventory in a new system that is to run for many years.

OK

4. (Reviewer: G. Krafczyk) Comments on proposal of using recovered long ceramic beam tubes for NuMI: Please proceed! The solution looks good. I don't think that you need 10 yes votes to proceed.

OK

5. (Reviewer: G. Krafczyk) The mechanical support department should continue on a measured pace to get a solution to long Beam tubes.

OK

6. (Reviewer: F. Lange) Comments on proposal of using recovered long ceramic beam tubes for NuMI This appears to be the appropriate solution to pursue for the NuMI kickers. I am not aware of any other concerns or questions for these devices.

OK

## Alternative Beam Tube Options

Presenter: S. Reeves

1. (Reviewer: D. Capista) Clearly more investigation is necessary for alternatives. Glass tubes should be given equal consideration. I feel there is unjustified bias toward the use of PEEK.

NuMI will use ceramic tubes.

2. (Reviewer: D. Jensen) The efforts to obtain new tubes is important. I was surprised that glass seemed to be in such disfavor with respect to peek. Glass has been used for decades in plumbing in corrosive environments. Plumbers were installing it glass waste pipes in the refurbishing of the chemistry building in 1963 when I was an undergraduate. That plumbing traveled from the 4th floor to the basement. It seems it was standard technology, and deemed robust. In terms of vacuum - my experience as a beginning graduate student was to work with a glass vacuum system where the pressures were routinely below  $1\text{E-}11$ , with very modest glass mercury diffusion pumps. So I have always thought of glass as an excellent material for high vacuum work. I would hope therefore that the R & D on glass continue along with the R & D on peek.

This is the responsibility of AD MSD for a long-term replacement to ceramic.

## Plan for NuMI Kicker Beam Tubes

Presenter: S. Childress

1. (Reviewer: T. Anderson) The Kovar to Monel weld joint should be cycle tested (at least 1000 cycles).

The weld joints were subjected to careful QA checks, however they were not cycle tested as suggested.